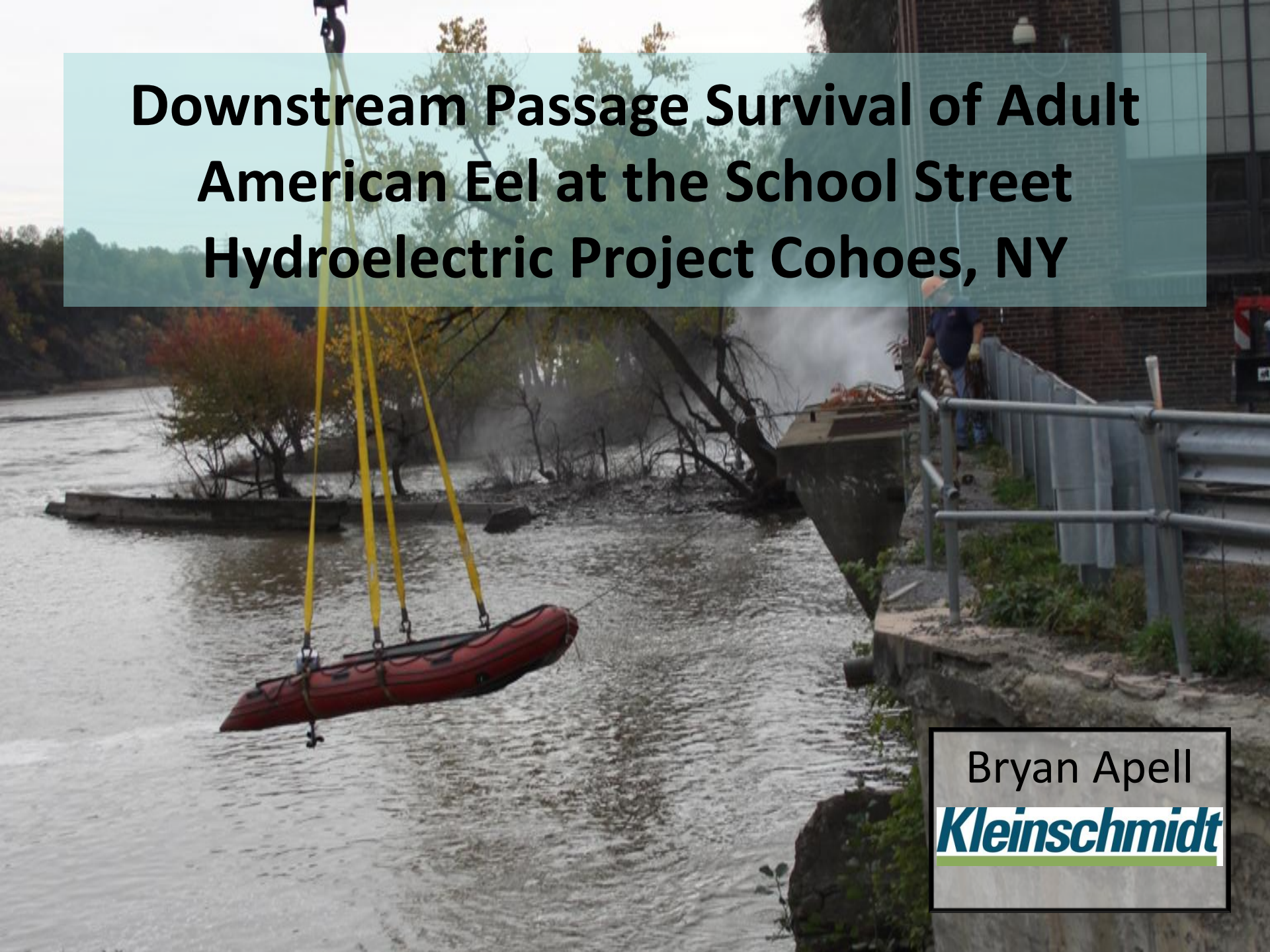
Downstream Passage Survival of Adult American Eel at the School Street Hydroelectric Project Cohoes, NY



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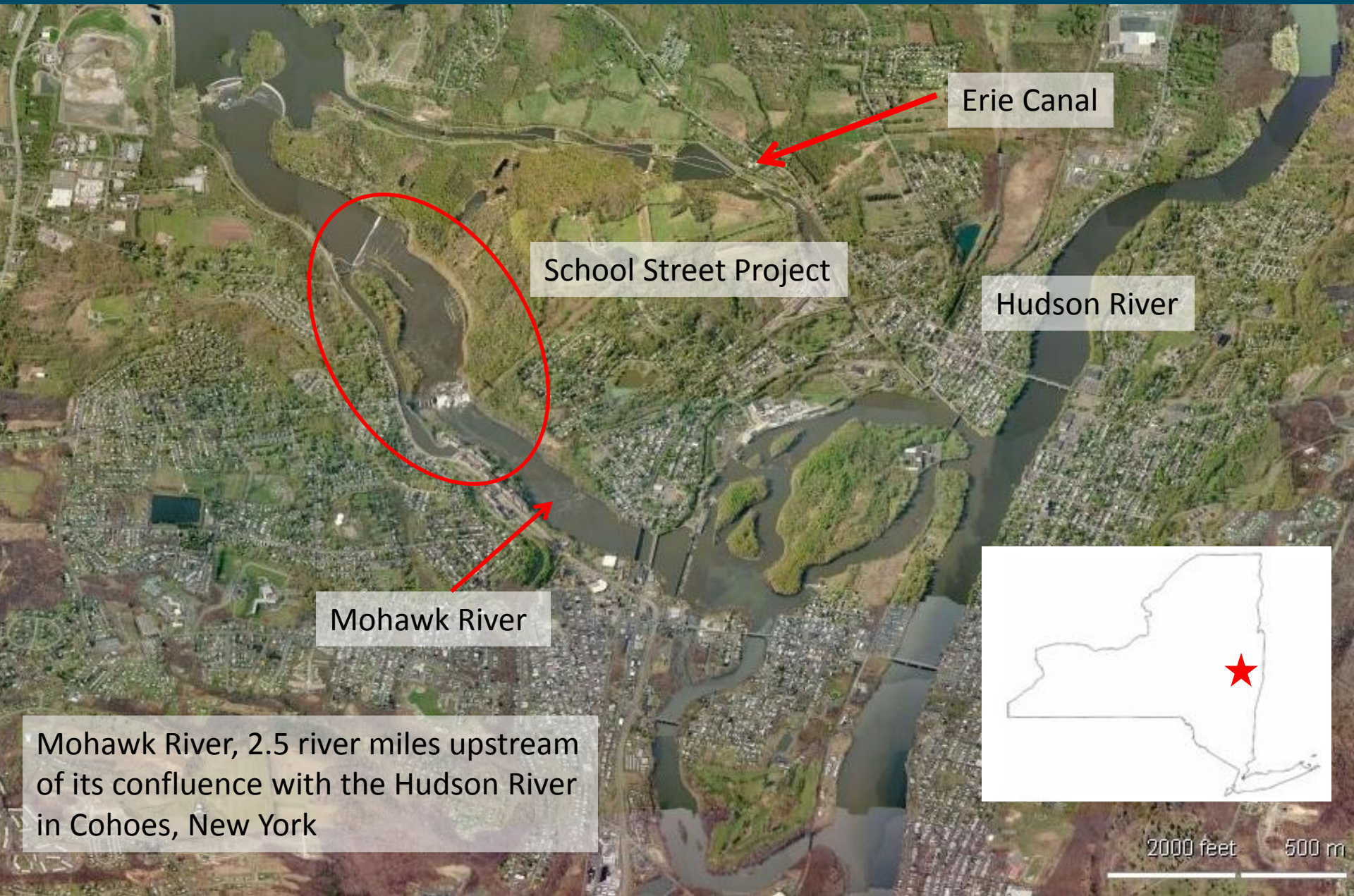
Introduction

School Street Project

Brookfield Renewable Power

- Issued a new FERC License on February 15, 2007
  - Downstream fish passage for anadromous and catadromous fish, as well as resident fish, was required as part of the new license.
- Evaluation of downstream fish passage
  - Conducted a *Release-Recapture* Study to evaluate bypass survival of adult American eel.

Project Location



Mohawk River, 2.5 river miles upstream of its confluence with the Hudson River in Cohoes, New York

Project Information

Consists of :

- a stone masonry gravity dam, 16 ft in height, extending 1,280 ft across the Mohawk River
- The dam constructed in 1865
- The reservoir has a surface area of 100 acres and a gross storage capacity of 788 acre-ft
- an upper and lower gatehouse
- a power canal extending approximately 4,400 ft from the dam to the powerhouse
- a powerhouse with 5 vertical shaft Francis turbines rated at 92 ft of head with at total power capacity of 38.8 megawatts

Fish Passage Facilities

Consist of:

- an angled bar rack with one inch clear spacing and a fish conveyance system

Pre-Construction

Conveyance System

- Located near the downstream end of the angled bar rack
- Two intake portals and a multi-level gate with top and bottom entrances

Fish Separation Chamber

Fish Return

Discharge ~ 45 CFS at 47 ft/s
Drop ~ 90 ft

Study Design and Methods

- Study Objectives
  - Assess the survival of out-migrating Adult American eel by conducting a release-recapture study
  - Inject test eel into the fishway and recover them in the Project tailrace in a manor that minimizes injury/mortality due to re-collection stresses
  - Evaluate the survival rate of eel that have been subjected to the stresses of the fishway in order to estimate Project passage survival.

Test Eels

- Collection efforts 2009 and 2010 were unsuccessful due to the limited availability
- In 2011, 150 eel were purchased from a commercial fishery on the Sebasticook River, ME weighing 413 pound
- Average weight 2.75 pounds
- Transported via truck to Conroy's bait in Cohoes, NY

Test Eels

- A subsample (45) was tested for pathogens as required by NY state law.
- Pathogen testing was conducted by Kennebec River Biosciences and included;
    - viral hemorrhagic septicemia (VHS), Spring Viremia of Carp Virus, Furunculosis, Enteric Red Mouth, and Infectious Pancreatic Necrosis (IPN).
- Required a 30+ day holding period (days held 42).
- All tests were negative - eels safe for use.
- Sample size (n=105) test eels.

Re-capture

- A custom net pen was designed and constructed
- The net pen design took into account:
  - the need to capture the entire discharge of the fish bypass flow
  - the need to eliminate or otherwise minimize re-capture related stress and mortality
  - fish retention
  - logistical considerations

Net Pen

- Floating net pen
- Dimensions: 28’ L x 12’ W x 6’ D
- Floating work platforms

Net Pen Deployment

Floating Support Dock

Net Pen Deployment

Net Pen Deployment

Net Pen Deployment

Caution

Net Pen Deployment

Test Trial

- The evaluation was conducted on October 12 and 13, 2011.
- 105 test eels were injected into the weir pool, recaptured using the custom net pen and held overnight (15.5 hrs) to assess latent mortality.
- Eels were assessed as *Alive or Dead.*

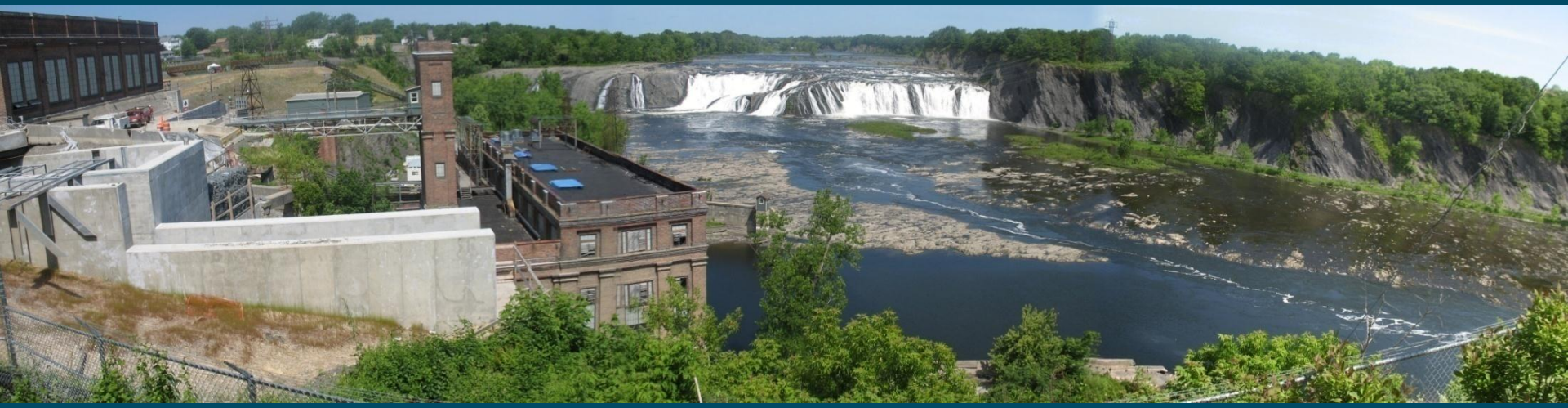
Results

- Survival (n= 56) – 100%

Conclusion

- The recently installed downstream bypass at the School Street Project effectively passes adult emigrating American eels as evident by the 100% survival result.
- This result suggests that bypass survival is not a limiting factor to successful downstream passage at the Project.
- Though recapture efficiency was less than anticipated, a large group (n=56) were tested and were representative of survival at the Project.

Questions?



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